

Remarks

Favorable consideration of the subject application is respectfully requested in view of the above amendments and the following remarks. Following the amendments, claims 11-26 are pending in the application, with claim 11 being in independent format.

A marked-up version and a clean version of a Substitute Specification are submitted herewith. The specification has been amended to correct minor typographical and translational errors and to conform the specification to US practice. No new matter has been added to the Substitute Specification. Figs. 1, 2a, 2b and 3a have been amended to correct minor, typographical errors. Specifically, Fig. 1 has been amended to include reference number 4, former Fig. 2a has been correctly renumbered as Fig. 2b, former Fig 2b has been correctly renumbered as Fig. 2a, and Fig. 3a has been amended to include reference number 8.

Original claims 1-10 have been cancelled and rewritten as newly added claims 11-26 in order to correct minor translational errors and to conform the claims to US practice.

It is urged that support for all the above amendments may be found throughout the specification as originally filed. It is further submitted that the above amendments are not being made for reasons of patentability and therefore do not give rise to prosecution history estoppel.

Early consideration and allowance of the amended application is respectfully requested.

Respectfully submitted,

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SUBSTITUTE SPECIFICATION - (Marked-up version)

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ICE CHOPPER CRUSHER

Field of the Invention

10 The present invention relates to an ice ~~chopper~~ crusher according to the preamble of patent claim 1, for chopping, crushing or breaking up ice and other ~~liquid~~ frozen liquid foodstuffs.

Background of the Invention

15 Onion and vegetable choppers are known from EP-B-0'345'223 and WO01/58652 of the applicant. They comprise a housing able to be pushed over the product to be broken up and a knife which is guided in the housing and which may be displaced against the force of a spring by way means of an actuating mechanism with comprising a push button and a plunger against the force of a spring. The knife comprises a cylindrical arbour axle or rod on whose lower end a 20 plate-like knife holder is seated. On the lower side of the knife holder there are fastened one or more downwardly projecting blades which in a plan view are mostly designed wave-shaped or star-shaped. The knife may be displaced downwards against the force of the spring until the blade has completely penetrated the material to be chopped and abuts the base plate of the chopper. For the perfect functioning of all known choppers it is decisive important that the 25 lower cutters or utter cutting edges of the blades lie exactly in a horizontal plane.

Although such choppers are not designed for this, ice cubes are often cut up with such known choppers in order to obtain finer pieces of ice for cocktails, drinks or for preparing foodstuffs. The chopping of ice may very easily blunt or bend the known blades. Bent blades 30 jam very quickly with the scrapers, and by way of this very thereby significantly compromise compromising the functioning ability of the chopper.

It is therefore the object of the invention to provide an apparatus which alleviates these disadvantages.

35

5 **Summary of the Invention**

An ice chopper crusher according to the present invention achieves this object comprises
a housing able to be pushed over the goods to be cut up and with an axle, or rod, which is
guided in a housing upper part and which may be displaced downwards against the force of a
10 spring by way of an actuating mechanism with a push button, wherein the axle at is lower end
carries a knife provided with a toothed cutter.

Brief Description of the Drawings

Hereinafter, embodiments examples of the invention are described by way of the
15 accompanying drawings, in which. There are shown in:

- Fig. 1 is a partial longitudinal section through an ice chopper crusher according to one
embodiment form of the invention;
- 20 Fig. 2a is a longitudinal section through a beaker according to a preferred embodiment form
of the invention;
- Fig. 2b is a view from above into a beaker according to Figure 2a;
- 25 Fig. 3a is a longitudinal section through a shaker attachment [top] with a lid;
- Fig. 3b is a view of the opened shaker attachment [top] (without lid) according to Fig. 3a,
from above;
- 30 Fig. 4a is a partial view of a knife according to a preferred embodiment form of the
invention;
- Fig. 4b is a part partial view of a blade according to a further preferred embodiment form of
the invention;
- 35 Fig. 4c is a longitudinal section through a cutter of a knife according to Figure 4a; and
- Fig. 4d is a longitudinal section through the cutter according to Figure 4b.

5 **Detailed Description**

The ice chopper, or crusher, shown in Figure 1 comprises a housing 1 which consists of a multi-part upper part 2 and a preferably single-part lower part or beaker 3. The beaker 3 is connected to the upper part 2 by way of a bayonet closure 33 or likewise similar device. Similarly Similar to the known onion and vegetable choppers, an actuation mechanism 4 is concentrically mounted and guided in the housing upper part 2, and this. This mechanism comprises a push button 17 with a cap 18. In the housing upper part there is attached a knife 5 which may be displaced against the force of a spring by way of the actuation mechanism 4. The actuation mechanism 4 comprises a known positive displacement mechanism which is known in the art and thus is not shown in detail in Figure 1. The positive displacement mechanism ensures that with each to and fro movement the knife 5 rotates about its longitudinal axis by a certain angle. This rotation movement ensures that the knife does not chop on the same spot. In contrast to known vegetable choppers, with the present ice chopper one may do away with the does not require a scraper which may be pushed over the knife.

20 The knife 5 comprises a cylindrical arbour vertical axle or rod 11 on whose lower end there is seated a horizontally arranged plate-like carrier plate 6. On the lower side of the carrier plate 6 there are fastened one or more downwardly projecting blades 51 which in a plan view are mostly wave-shaped or star-shaped. The present invention may be realised with all employ any previously known previously mentioned blade shapes. For reasons of cost, the arbour vertical rod 11 and the carrier plate 6 are mostly preferably manufactured as one piece by way of injection moulding, wherein one injects around the blade 51 in an upper region, and by way of this it whereby the blade 51 becomes nondetachably fastened to the carrier plate. In order to withstand the loading during chopping, the knife 5 is preferably manufactured of sturdy blade sheet metal of 0.3 to 0.5, in particular more preferably 0.4 mm thickness D.

30 In a preferred embodiment form of the present invention, as is shown in Figure 1, the height H_K of the blade 51, the height of the beaker H_B and the maximal vertical path of the knife 5 limited by the actuation mechanism are selected and matched to one another such that the blade cutter 52 in its lowermost position does not come into contact with a beaker base 31. Thus in the lowermost knife position (in Figure 1 shown dashed) there remains an air gap H_S between the downwardly directed tips of teeth 53 of the blade cutter 52 and the base of the beaker 31.

5 As ~~will yet be further specified~~ described below, the beaker fulfils a double function and
is also used as a shaker lower part. In a preferred embodiment, it It is therefore manufactured of
stainless steel ~~in a preferred embodiment form~~. The air gap H_S thus prevents a direct abutment
of the blade cutter 52 with the stainless steel base and ~~due to this~~ thus prevents an undesired
blunting of the blade cutter and damage and scratching of the base 31. The height of the air gap
10 H_S is preferably between 1 and 7 mm, ~~and is particularly~~ more preferably between 3 and 5 mm.

15 If ~~in~~ In a further embodiment ~~form~~ which is not shown, the above-described beaker is
may be replaced by a cylindrical housing part open to the bottom, ~~then its~~. The height of the
housing is again selected such so that sensitive working surfaces are not contacted by the blades
and may will not be damaged on chopping.

20 Whilst ~~with~~ With known choppers such an air gap is not ~~desired at all~~ desirable since it
would lead to an unacceptable compromising of its functioning, however with the present new
ice chopper a complete penetration of the ice cubes to be chopped ~~in~~ is not necessary. The ice
cubes are broken apart by the sturdy blade 51, and do not need to be completely severed.

25 The breaking-apart effect of the blade is further encouraged by preferred designs of the
blade. With the blade shown in Figure 4a and 4c the teeth are ground on both sides, wherein the
cutting angle γ is preferably selected between 30 and 100°. With the blade shown in Figure 4b
and [[4c]] 4d the teeth are ground on only one side and the cutting angle γ' is about 45°.

30 The toothing of the blade may be selected according to the blade material and the
manufacturing costs. Two possible tooth shapes are shown in the Figures 4a and 4b. On
chopping the hard and brittle ice cubes, the significant advantage of the toothed blades is that the
teeth or the tips of the teeth simplify the penetration into the ice to be chopped.

35 In a further embodiment ~~form~~ which is not shown, the teeth are bent alternately laterally
out of the vertical plane of the blade and ~~by way of this again~~ thereby reinforce the breaking-up
effect of the ice chopper blade. The teeth may also be bent out of the vertical plane of the blade
sheet metal twisted about their vertical axis so that the tips of the teeth still essentially lie in one
plane and may penetrate the ice with relatively little resistance, and the breaking-up effect is
enormously increased on further penetration due to the torsion of the teeth.

5 In Figure 2b there is represented shows an underlay 7 adapted to the beaker, preferably of a soft elastomer such as silicone. The underlay 7 may be rigidly permanently or detachably connected to the beaker base 31 and/or to a circumferential peripheral stand ring 32. On chopping, the underlay 7 prevents the working surface from being scratched, damps the knocks and effect a slipping securement of prevents the chopper 1 from slipping on a working surface.

10 When the ice has been reduced to the desired size, then the beaker 3 by way of the bayonet closure 33 may be removed from the upper part 2 by means of the bayonet closure 33 and by lifting may be removed from the underlay by lifting, and the upper part 2 with the blade may now be placed on the free underlay 7. The depositing of the knife 5 on the underlay 7 simultaneously protects both the cutter 52 and also the working surface from damage. The

15 underlay 7 preferably has a peripherally thickened circumferential edge bead 71 which prevents melted water which runs down or drips from the knife or other parts of the upper part 2, from running onto a working surface lying below this.

The sidewall 30 of the beaker 30 widens to the top at an angle α so that with a removed chopper the upper part 2 removed one may fasten a fitting shaker attachment, or top, [top] 8 in a clamped manner. The attachment, or top, [top] 8, as shown in Figure 3 has a sidewall 81 which tapers downwards at an angle β and which towards the top merges into the neck 83 via a cone 82. In the known manner a A sieve plate 84 with pour-out openings 85 is attached in the neck 83, and a lid 9 may be placed on for closure. The angles α and β are (between 1 and 15°, in the preferred embodiment example preferably 4°). Angles α and β and the diameter diameters of the upper beaker region and the lower attachment [top] wall are matched to one another such that the attachment [top] may be placed into the beaker approximately up to the transition of the wall 81 to the cone 82 may be stuck into the beaker and by way of this, thereby achieving an adequate sealing of fluids to the beaker is achieved to fluids.

30 The inner wall of the beaker is preferably provided with a grading in 10 decilitres and the shaker attachment [top] lid 9 preferably has a volume capacity of 40 millilitres which is an important measure to barkeepers.

35 In order to meet the standards of hygiene required for use in the kitchen and bar region, the chopper upper part, beaker, shaker attachment [top] and lid are manufactured of stainless steel, and/or of plastic suitable for foodstuffs, or a combination thereof. All combinations of these materials are possible depending on design and the price class.

	1	ice chopper
	2	housing upper part
10	3	beaker
	4	actuating mechanism
	5	knife
	6	carrier plate
	7	underlay
15	8	attachment [top]
	9	lid
	11	<u>arbor</u> <u>axle</u>
	12	carrier plate
	13	<u>reinforcement</u> <u>rib</u>
20	17	push button
	18	cap
	19	<u>shock</u> <u>absorber</u>
	20	housing outer wall
	21	<u>housing</u> <u>base</u>
25	30	beaker wall
	31	beaker base
	32	stand surface
	33	bayonet closure
	51	blade
30	52	cutter, 52' cutter
	53	teeth, 53' teeth
	71	edge bead
	81	attachment [top] wall
	82	cone
35	83	neck
	84	sieve plate
	85	pour-out openings

Patent claims

I claim:

1. A hand-operated chopper (1) for cutting up ice, with a housing (2, 3) able to be pushed over the goods to be cut up and with an arbour (11) which is guided in a housing upper part (2) and which may be displaced downwards against the force of a spring (14) by way of an actuating mechanism (4) with a push button (17), characterised in that the arbour (11) at its lower end carries a knife (5) provided with a toothed cutter (52).
2. A chopper (1) according to claim 1, characterised in that the housing upper part is detachably connectable to a beaker-like housing lower part (3) closed at the bottom.
3. A chopper (1) according to claim 2, characterised in that a height H_K of the blade (51), a height H_B of the beaker (5) and a maximal vertical path of the knife (5) limited by the actuating mechanism (4) are selected and matched to one another such that the cutter (52) in its lowermost position does not come into contact with a beaker base (31) so that in this lowermost knife position there exists an air gap H_S between the downwardly directed tips of the teeth (53) of the cutter (52) and the beaker base (31).
4. A chopper (1) according to one of the claims 1 to 3, characterised in that the teeth (53, 53') of the knife (5) are ground on one or both sides, wherein the cutting angle (γ, γ') is selected between 30 and 100°, preferably at 90° for those ground on both sides and 45° for those ground on one side.
5. A chopper (1) according to claim 1 to 4, characterised in that the teeth (53) are either i) alternately bent laterally out of the vertical plane of a blade (51) of the knife (5), or ii) are bent out of the vertical plane of the blade sheet [metal] twisted about their vertical axis, so that the tips of the teeth (53) essentially still lie in the plane and due to this reinforce the breaking-apart effect on chopping.

6. A chopper (1) according to one of the preceding claims 1 to 5, characterised in that the beaker (3) given a removed chopper upper part (2) may be detachably connected to a shaker attachment [top] (8) in an essentially fluid-tight manner.
7. A chopper (1) according to claim 6, characterised in that the beaker (3) widens towards the top at an angle α and the attachment [top] (8) comprises a sidewall (81) which tapers downwards at an angle β and which towards the top merges into a cone (82), and that the diameter of the upper beaker region and of lower attachment [top] wall are matched to one another such that the attachment [top] may be inserted into the beaker approximately up to the transition of the wall (81) into the cone (82) and by way of this an adequate sealing of fluids to the beaker is achieved.
8. A chopper according to claim 7, characterised in that the angles α and β are between 1 and 15°, preferably 4°.
9. A chopper (1) according to one of the preceding claims 1 to 8, characterised in that it comprises an underlay (7) adapted to the beaker (3), preferably of a soft anti-slip elastomer such as silicone.
10. A chopper (1) according to claim 9, characterised in that the underlay (7) comprises a peripherally thickened circumferential edge bead (71).

ICE CRUSHER

Abstract

A chopper, or crusher (1) for breaking up ice, with comprising a housing (2, 3) able to be
10 pushed over the goods to be broken up and with a knife (5) with a blade having a toothed cutter
(52) is provided. A An upper housing part (2) is detachably connectable to a beaker-like housing
lower part (3) closed at the bottom, and in In a preferred embodiment, form of the present
invention the height H_K of the blade (51), the height of the beaker H_B and the maximum vertical
path of the knife (5) limited by an actuation mechanism (4) are selected and matched to one
15 another such that the cutter (52) in its lowermost position does not come into contact with the
beaker base (31). ~~On account of this even in the lowermost knife position an air gap HS remains~~
~~between the downwardly directed tips of teeth (53) of the cutter (52) and the beaker base 31.~~
~~The beaker (3) fulfils a double function and is also used as a shaker lower part together with a~~
~~shaker attachment [top] (8) specially adapted to the beaker (3).~~